cubit of 17·5 inches, divided into twenty-four digits, is also almost identical with the ancient Egyptian natural cubit of six palms and twenty-four digits. But it appears to be now impossible to determine whether these Indian units were derived from the Egyptian, or both from an earlier common source; although we may fairly assume that this natural cubit was of the same length as that used by Noah before the Deluge. Mr. Thomas's hypothesis of the lesser Indian unit of weight and of length, and of the scale of multiples and parts, is, however, probably correct, as being derived from natural and local sources.

## *OUR BOOK SHELF*

*Arboretum et Fleuriste de la Ville de Paris.* Description culture et usage des Arbres, Arbrisseaux et des Plantes herbacées et frutescentes de plein air, et de serres, employées dans l'ornementation des Parcs et Jardins. Par A. Alphand. Folio, pp. 110. (Rothschild, Paris.)

ORNAMENTAL gardening, among other things that added to the attractions of the city of pleasure, was greatly fostered during the latter part of the reign of Napoleon III., and does not appear likely to languish under the Republic. The magnificent publication, "Les Promenades de Paris," by the author of the book now before us, is a costly work, known to comparatively few people in this country. We presume that the present volume is regarded as an appendix or supplement to the work named, otherwise we cannot account for the publication of what is little more than a catalogue of names in so unwieldy a form.

An enumeration of the plants grown for the embellishment of the parks and gardens of Paris, in a handy octavo form, would be welcome to almost every lover of horticulture; but the object of the compiler of the "Arboretum et Fleuriste" was doubtless such as we have indicated. It is printed on one side of the paper only, and the matter arranged in columns, giving the names, native countries, soil, use, height, form of leaves, colour of flowers, &c., of the various plants. As a horticultural catalogue the work is fairly well executed, but, like most gardening books, it contains errors that have been copied from book to book, though they were cleared up long ago. In the first part of the work the author has indulged in an attempt to introduce a reform in botanical nomenclature; why it was not carried through we are not told, probably for the reason that, however desirable reformation may be, this one would scarcely receive any support from botanists. It consists in giving all substantive specific names an adjectival form, and, a less justifiable act, of changing the terminations of good Latin names. Thus, for example, *Pinus Coulterii*, *Hartwegii*, and *Fenzlii*, become *P. Coulterea*, *Hartwegea*, &c. Objections might be urged against this course; but why should we change *Benthamiana* and kindred names into *Benthamea?* And *Pinus inopsea* for *P. inops* is quite inadmissible.

The information under the several headings is usually not inaccurate, but somewhat loose. Thus, under the genus *Magnolia*, Pennsylvania is given as the native country of *M. acuminata*, Carolina of *auriculata*, Virginia of *glauca*, and so on; whereas these trees have a much wider range of distribution. Again, under *Cratægus coccinea*, we are told that the specific name indicates scarlet flowers; but the flowers are white, and the fruit scarlet. But as it is not a botanical work, it is scarcely fair to criticise it by a botanical standard, though it is scarcely excusable to give North Africa as the native country of *Calla Æthiopica*, New Zealand of *Caladium esculentum*, &c. *Libocedrus decurrens* is referred to *Thuja gigantea*, and the true *T. gigantea* to *T. Menziesii;* but the synonomy of these plants has long been cleared up even in gardening books.

## *LETTERS TO THE EDITOR*

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

### Prof. Willis's Mechanical Models

THERE is a slight error in your account of the disposition of Prof. Willis with regard to his mechanical models in your last impression (p. 14).

Prof. Willis did not put any price upon his models; but by his will, dated May 11, 1872, directed that his "mechanical models" should be "offered to the University of Cambridge at a price to be fixed by the valuation of some competent appraiser to be nominated and chosen" by his executors.

In consequence, we have caused the models to be so valued, and fixed upon the sum named (1,200*l.*) after due consideration of the means of the University and the requirements of the estate.

A Syndicate was appointed on April 29 to consider whether the whole or a part of the collection shall be purchased. In the event of the University declining to purchase, the portion rejected will be offered for sale by public auction or private contract.

JOHN WILLIS CLARK
W. H. BESANT
Cambridge, May 9 Executors to the late Prof. Willis

### Ants and Bees

IN NATURE, vol. xi. p. 306, Mr. Alfred George Renshaw refers to and criticises a paper on "Ants and Bees," lately read by Sir John Lubbock, and assumes, or seems to assume—and the language quoted justifies such assumption—that Sir John advanced the idea that bees have no means of communicating knowledge to each other.

It seems strange to me, who have been all my life familiarly acquainted with the working of bees, that anyone should doubt their power of communicating knowledge. The very idea there advanced, that "if the bees had the means of communicating knowledge, those bees would have told the others in the hive where they could obtain a good store of honey with a very little trouble, and would have brought a lot back with them," I have seen proved and illustrated hundreds of times.

Bee-hunters understand this faculty in the bee perfectly well, and turn it to a good account. Going to a field or wood at a distance from tame bees, with their box of honey, they gather up from the flowers and imprison one or more bees, and after they have become sufficiently gorged, let them out to return to their home with their easily-gotten load. Waiting patiently a longer or shorter time, according to the distance of the bee-tree, the hunter scarcely ever fails to see the bee or bees return, accompanied with other bees, which are in like manner imprisoned, till they in their turn are filled, when one or more are let out at places distant from each other, and the direction in each case in which the bee flies noted, and thus, by a kind of triangulation, the position of the bee-tree proximately ascertained.

Those who have stored honey in their houses understand very well how important it is to prevent a single bee from discovering its location. Such discovery is sure to be followed by a general onslaught from the hive unless all means of access is prevented. It is possible that our American are more intelligent than European bees, but hardly probable; and I certainly shall not ask an Englishman to admit it. Those in America who are in the habit of playing first, second, and third fiddle to Instinct will probably attribute this seeming intelligence to that principle.

It seems to me, and I think it may be so concluded on scientific principle, that there is no difference, except in degree, between the intelligence, or whatever it may be called, of man and of lower animal life. If the honey-bee, the ballooning spider, the agricultural ant, or the dog, is governed wholly by instinct, then it seems reasonable to infer that man is also governed by instinct. If all the actions of lower animal life are automatic, on what principle shall we say that man's are not automatic? If man builds his house, and, intending to furnish it and lay in a stock of provisions, ascertains from his neighbour where he can get the most at the cheapest rate, does he act on any principle different from the bees, who build their house and jointly or separately ascertain where the best stock of honey can be obtained?

In regard to selfishness, I think the bee has the advantage of

man. In my own garden, where I have had standing always from ten to fifty swarms, and over which I thought I was watching with almost a fatherly affection, I have learned how utterly selfish I was in looking forward to autumn, when, by the destruction of the industrious and unselfish bees, I could lay in for my own consumption what they had so laboriously gathered in the summer to sustain each other through the winter. I learned, from their unselfishness, to divide with them, always leaving enough to sustain the colony till the spring should again bring the flowers.

I think, too, that both Sir John Lubbock and your correspondent are mistaken as to the object of beating pans, sounding horns, and making other hideous noises in hiving bees. The object is not, as Sir John intimates, originally to drive away evil spirits, or to assert ownership, as indicated by Mr. Renshaw. It is simply, as everyone knows who ever thumped on a pan, sounded a horn, or yelled through a speaking trumpet on such an occasion, to drown the voice of the queen or guides who are to conduct the swarm to the new home which members of the community who had been sent out, as the Israelites sent forward Joshua and others, had found for them.

Mr. Renshaw's law is probably good, but does not apply in the case trying. JOSIAH EMERY

City of Williamsport, Pa., U.S.

## Flowering of the Hazel

IT was with great interest that I read the communication from F. D. Wetterhan, in NATURE, vol. xi. p. 507. But I cannot help expressing quite a different opinion as to the bearing of the interesting fact that proterandrous and proterogynous individuals are to be found in the same locality. From the structure of the flowers and from insects never visiting the stigmas, I am convinced that the hazel is a strictly anemophilous plant; that the red colour of its stigmas is solely an effect of chemical processes connected with the development of the female flowers to maturity, just in the same manner as in the female flowers of the larch-tree and some other Coniferæ; and that likewise the coexistence of proterandrous and proterogynous individuals in the hazel relates solely to the influence of the wind, and not at all to the agency of insects.

Whilst in Primula, Pulmonaria, and many other entomophilous plants, so admirably treated of by Charles Darwin, two kinds of individuals, viz., long-styled and short-styled ones, have originated from the positions of the anthers and the stigmas diverging in different individuals in opposite directions—among the anemophilous plants in *Juglans regia* * and *Corylus avellana*, among the entomophilous ones in *Syringa vulgaris* † and *Veronica spicata*, ‡ two kinds of individuals, namely, proterandrous and proterogynous ones, have originated from the periods of development of the anthers and stigmas diverging in different individuals in opposite directions. The effect in the two contrivances has been the same, cross-fertilisation not only between different flowers, but also between different branches, having become indispensable.

In dimorphous species, this cross-fertilisation, as is known, is effected by the visiting insects touching with the same part of their body the anthers of the long-styled and the stigmas of the short-styled form; and with some other part of their body the anthers of the short-styled and the stigmas of the long-styled form. This kind of intercrossing can apparently never be effected by the wind; whence long-styled and short-styled (dimorphous) species are never to be found among anemophilous plants. But in these the coexistence of proterandrous and proterogynous individuals produces the same effect, the pollen-grains of the proterandrous individuals, of course, being transported by the wind only to the stigmas of the proterogynous ones, and *vice versâ*.

Lippstadt, May 1 HERMANN MÜLLER

## Variable (?) Star in Sextans

THE following may be of interest to the readers of your Astronomical Column:—

About 2½° *north* of, and a little *preceding* λ Hydræ (4 mag.), is a star marked 5th mag. in Harding's large *Atlas Novus Cælestis* (1822). This is now invisible to the naked eye, and of about mag. 7. It is 19662 in Lalande's Catalogue, in which it is rated at 4½ mag. It seems difficult to understand how excellent observers like Harding and Lalande could have made a mistake of 2 magnitudes in the estimation of a star's brightness, particularly as it is closely preceded by a 7½ mag. star (Lalande, 19646). So that probably this star has faded since 1822. Its position for the beginning of the present year is in R.A. 9h. 57m. 30·46s., and N.P.D. 98° 58′ 0″·42.

Punjab, India, April 3 J. E. GORE

## Equilibrium in Gases

MR. NICHOLS, in NATURE, vol. xi. p. 486, advances the opinion that in a vertical column of gas at rest the temperature does not tend, as generally believed, to become equal throughout, but that such a column is in a state of thermal equilibrium when the temperature diminishes at the rate of 1° centigrade for every 233 feet of ascent (or 1° Fahr. for every 129 feet). This is a question of thermo-dynamics, and I am not mathematician enough to offer any opinion on it from the theoretical point of view, but it seems inconsistent with well-known meteorological facts. Were it true, there would be, as Mr. Nichols points out, a constantly renewed tendency for the lower strata to flow upwards in consequence of their higher temperature and consequent relative expansion. Such a tendency is no doubt very common, but Mr. Nichols's theory would require it to be universal, and it does not appear to exist in the absence of direct solar heating. Cumulus cloud is an infallible proof of the presence of ascending columns of air, and according to the report of the Austrian Polar Expedition in NATURE, vol. xi. p. 415, cumulus is never seen in the Arctic winter; and I have somewhere read the same respecting the Siberian winter. The true cause of the accumulation of heat in the lower atmospheric strata, to which upward currents and the formation of cumulus is due, is, I have no doubt, that usually assigned—namely, that the atmosphere is more pervious to the heat of the sun than to heat radiated back from the earth; so that, as I think Tyndall expresses it, the sun's heat is caught as in a trap. JOSEPH JOHN MURPHY

Old Forge, Dunmurry, Co. Antrim,
April 30

## Curious Phenomenon of Light

ROWING on Loch Lomond recently, above Luss, there were seen to the north-west, at an apparent distance of about 100 yards, two bright lines of prismatic light, 60° apart and on the level of the water. Their length seemed to equal the breadth of a rainbow. Their violet ends were towards each other, and were joined by a line of dull white light, to the middle of which the sun and the spectator were at right angles. Standing in the boat, the colour and brilliancy were lost, and only a diffuse white light was visible. The time was 10 A.M. The sun was hot, the sky cloudless, the air hazy and still, and the loch a mirror. This apparition fled before our approach for some minutes, till dispelled by a slight breeze, which rippled the water.

Luss WM. M'LAURIN

## Destruction of Flowers by Birds

I ENCLOSE some flowers of the common blackthorn, that I suppose to have been snipped off by birds. The bushes were growing in the outskirts of a wood, in a very sequestered situation (near Dunstable). The upper branches appeared to have chiefly suffered. The grass below was quite conspicuously starred with the fallen blossoms. I can hardly think that human intervention had anything to do with it. R. A. PRYOR

Hatfield, May 5

[In the accompanying specimens the limb of the calyx (carrying the stamens and petals) had been neatly cut away from the tube.]

## *OUR ASTRONOMICAL COLUMN*

ORBITS OF BINARY STARS.—Dr. Doberck, of Colonel Cooper's Observatory, Markree, Co. Sligo, has published the results of a new investigation of the elements of the revolving double star σ Coronæ Borealis, in which measures to the end of 1872 are included. The period of revolution is increased to 843 years, which is longer than any yet assigned to this star. Dr. Doberck's comparison of his orbit with the measures of the late Rev. W. R. Dawes affords another proof of the remarkable excellence of that astronomer's observations, particularly in the last

* Delpino, "Ulteriori osservazioni," Parte II. fasc. ii. p. 337.
† H. Müller, "Befruchtung," &c., p. 339.
‡ Ibid. p. 285.